



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/600,877	06/20/2003	Yongxin Wang	02-488	6680

719 7590 03/24/2006

CATERPILLAR INC.
100 N.E. ADAMS STREET
PATENT DEPT.
PEORIA, IL 616296490

EXAMINER

HOGAN, JAMES SEAN

ART UNIT PAPER NUMBER

3752

DATE MAILED: 03/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/600,877	Applicant(s) WANG ET AL.	
	Examiner James S. Hogan	Art Unit 3752	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 June 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5, 7-12 and 14-21 is/are pending in the application.
- 4a) Of the above claim(s) 12, 14-17 and 19-21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3 and 7-9 is/are rejected.
- 7) ☒ Claim(s) 2, 4, 5, 10, 11 and 18 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>7/7, 1/20 and 8/31</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S Patent 5,984,200 to Augustin

Regarding claim 1, Augustin discloses a fuel injector having a high-pressure fuel supply line (9), a fuel cavity (31), a check control cavity (not numbered, but located above member (2)), a check valve (generally (2)) at least partially disposed in the fuel cavity and being exposed to a fluid pressure force in the check control cavity; a control valve (8) moveable between a first position (in the “up” position of the member), at which the high-pressure fuel supply line (9) is fluidly connected to the fuel cavity (by un-numbered passage connecting at passage (17)), and a second position (with member (8) in the “down” position), at which the fuel cavity (31) is fluidly connected to said check control cavity (by the same un-numbered passage), a valve member (8) at least partially disposed within said control valve: and an electrical actuator (22) being adapted to directly move said valve member (col. 3, line 8), a low pressure drain (23) connected to the check control cavity (passage (17) to passage (11) and through passage (25) bored into member (8). As per claim 3, the valve has a translation location where the fuel cavity ((31) and the check control cavity (not numbered) are fluidly connected to the

Art Unit: 3752

high pressure fuel supply and a check control cavity line (17) extends between the control valve and the check control cavity includes an orifice (the not-numbered passage connecting the check control cavity to the supply passage (17)). As per claim 9 check piston of Augustin ('200) has a predetermined diameter in the check control cavity and that diameter, at the stem of the piston, is greater than the predetermined diameter of the valve, thus creating a seat.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,984,200 to Augustin.

As per claim 8, the fuel injector of Augustin, as previously reported in the rejection of claim 1 above, uses an electrical actuator to move the control valve member (7). Augustin does not show the actuator (22), although of the armature type, being connected to the valve member. However, connected armatures and control valve member are well known in the art and would only require routine skill in the art to substitute for the un-connected armature and control valve member in order to have a fuel injector that does not require a fluid connection to the top side of the valve member, and thus, is not subject to clogging.

Art Unit: 3752

As per claim 7, piezo-electric stack actuators are also well known within the art and would require only routine skill in art to substitute for the un-connected armature and control valve member as taught by Augustin.

Allowable Subject Matter

Claims 2, 4, 5, 10, 11 and 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure is as follows:

U.S. Patent No. 6,679,440 to Igashira et al., disclosing a fuel injector

U.S. Patent No. 6,267,306 to Phillips et al., disclosing a fuel injector

U.S. Patent No. 6,264,116 to Harcombe et al., disclosing a fuel injector

U.S. Patent No. 6,532,943 to Yudanov, disclosing a fuel injector

U.S. Patent No. 6,837,450 to Boeking, disclosing a fuel injector

U.S. Patent No. 6,360,721 to Schuricht et al., disclosing a fuel injector

U.S. Patent No. 6,027,047 to Augustin, disclosing a fuel injector


Any inquiry concerning this communication or earlier communications from the examiner should be directed to James S. Hogan whose telephone number is (571) 272-4902. The examiner can normally be reached on Mon-Fri, 7:00a-4:00p EST.

Art Unit: 3752

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Scherbel can be reached on (571) 272-4919. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JSH
3/8/2006



David A. Scherbel
Supervisory Patent Examiner
Group 3700